9/01

OPERATION MANUAL

MANUAL NO. 056-761-00
REV. G

LAB-LINE® AIR-JACKETED FLO-THRU® CO_2 INCUBATORS

MODEL NO. | 320, 320-1
322, 322-1
325, 325-1

DESIGNERS AND MANUFACTURERS
A SUBSIDIARY of Barnstead|Thermolyne
1999 North 15th Ave., Melrose Park, IL 60160-1491 USA
PHONE: (563) 556-2241 or (800) 522-5463; FAX: (563) 589-0516

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Warranty

BE ADVISED:

IT IS MOST IMPORTANT THAT THE USER FOLLOW INSTALLATION INSTRUCTIONS **EXACTLY AS WRITTEN**—FAILURE TO DO SO IS LIKELY TO LEAD TO IMPROPER OPERATION, ERRONEOUS CALIBRATIONS AND POSSIBLE DAMAGE TO THE EQUIPMENT. **UNDER NO CIRCUMSTANCES** SHOULD THE USER ATTEMPT OPERATION WITHOUT THIS INFORMATION.

THE FOLLOWING EQUIPMENT IS TO BE SUPPLIED BY THE USER:

- Dry CO_2 gas (research grade or better).
- A dual-stage regulator for the CO_2 tank.
- ¼" (6.35mm) ID Flexible tubing (appropriate length from tank to Incubator), and connected per local codes.
- Distilled or deionized water (if humidification is desired).
- Fyrite or similar chemical-based CO_2 analyzer.

BE ADVISED: INSTALLATION AND PRE-OPERATION PROCEDURE WILL TAKE AT LEAST 24 HOURS TO COMPLETE. DO NOT ATTEMPT TO RUSH THE PROCESS WITH SHORT CUTS TO THE PROCEDURES DESCRIBED IN THIS MANUAL.

CERTIFICATION OF DECONTAMINATION:

We cannot accept for service or credit a product that has been exposed to or contaminated with chemically or biologically toxic or infectious substances or subjected to radioactivity without first being certified as free from said contamination.

Please have your Medical and/or Safety Officer sign this form certifying that proper decontamination procedures have been followed to render the product safe and free from hazards.

Any product forwarded to us, not accompanied by this form and a proper Return Goods Authorization Number, will be returned to the sender. To obtain a Return Goods Authorization Number, contact the Customer Relations Department at (800) 522-5463.

We hereby certify that the LAB-LINE INSTRUMENTS, INC. product:

Model No. _____ and Serial No. _____,

that is being forwarded has been properly decontaminated and is free from all toxic hazards, infectious agents, radioactivity and/or other hazards.

Company/Institution Name:

Street Address: _____

City: _____ State_____ Zip_____

Name (please print): _____ Title _____

Signature: _____

Phone: _____

DECONTAMINATION PROCEDURE (Be Specific):

_____

_____

_____

Nature of Hazard That Required Decontamination:

_____

_____

_____

SECTION 1

INTRODUCTION

THANK YOU

for selecting Lab-Line Instruments for your equipment needs. For maximum value and ease of start-up,

PLEASE PROCEED AS FOLLOWS:

- Inspect the carton and contents for shipping damage. Notify the carrier immediately if damage is found.
- Use the Accessory Checklist when unpacking to verify that the complete unit has been received. Do not discard packing materials until all is accounted for.
- Read this Operation Manual thoroughly *before* deciding upon an appropriate location for the unit: you will want to consider the availability of power and other unit requirements, as well as user convenience.
- Insist that every operator of this unit becomes familiar with the Operation Section of this manual.
- Be sure to fill out the Warranty Registration Card and mail it in to Lab-Line Instruments within seven (7) days after receiving the unit.

IF

after reading this manual you should have any difficulties with the installation or operation instructions, please call:

Lab-Line Customer Relations Department
(800) 522-5463, or (563) 556-2241

ALL RIGHT RESERVED
The information contained in this manual is the exclusive property of Lab-Line Instruments, Inc., and has been provided solely to enable the users of the equipment described herein to operate and maintain such equipment. Any other use of this information, or the reproduction or transmission of all or any portion of this manual without prior written consent of the manufacturer is expressly prohibited. © 2001, Lab-Line Instruments, Inc.

SECTION 2

DESCRIPTION

The Lab-Line Air-Jacketed Flo-Thru CO_2 Incubator controls CO_2 concentration and temperature to create a growth environment suitable for tissue cultures, plants, cells, viruses and related organisms.

Incoming gas mixture passes through the rear plenum and is gently circulated throughout the chamber. Adjustable flow meters control air and CO_2 concentrations. An access port on the control panel permits chamber gas samples to be taken.

A microprocessor-based controller maintains temperature while a hydraulic thermostat provides over-temperature protection to the chamber in the event the main control should fail.

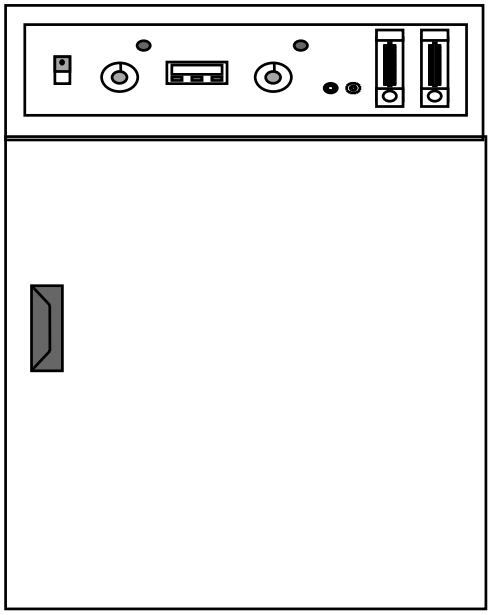
Heaters outside the chamber inner walls are positioned for uniform heat distribution, while high-density fiberglass insulation minimizes heat loss. A fan in the chamber ceiling gently circulates chamber atmosphere to prevent temperature and CO_2 stratification.

A double-door system enables unobstructed viewing of the entire chamber. In the steel outer door are heaters that can be turned on to defog the glass inner door, if necessary. Heat control for the steel outer door is on the back panel.

The leak proof chamber is constructed of heavy-gauge stainless steel and the steel cabinet has a powder coated finish for easy cleaning. Stainless steel shelves are adjustable and removable.

Differences between models in this series are the number of incubation chambers (one or two), and power requirements.

MODEL 320:



SECTION 3

SPECIFICATIONS

POWER REQUIREMENTS:

320:	120 V	60 Hz	6.3 Amps	750 Watts
320-1:	230/240 V	50 Hz	3.1 Amps	750 Watts
322:	120 V	60 Hz	12.5 Amps	1500 Watts
322-1:	230/240 V	50 Hz	6.3 Amps	1500 Watts
325:	120 V	60 Hz	12.5 Amps	1500 Watts
325-1:	230/240 V	50 Hz	6.3 Amps	1500 Watts

TEMPERATURE Range:	From slightly above ambient to 60ºC
HUMIDITY RANGE:	From ambient to 98% relative humidity.
CARBON DIOXIDE RANGE:	From 0 to 20% of the mixture.

DIMENSIONS

	OVERALL	CHAMBER
320, 320-1 SINGLE:	24-5/8"W x 25"D x 33"H (63 x 64 x 84 cm)	22"W x 22"D x 22"H (56 x 56 x 56 cm)
322, 322-1 DUAL, HORIZONTAL:	49¼"W x 25"D x 33"H (125 x 63 x 84 cm)	22"W x 22"D x 22"H (56 x 56 x 56 cm)
325, 325-1 DUAL, VERTICAL:	24-5/8"W x 25"D x 66"H (63 x 64 x 168 cm)	22"W x 22"D x 22"H (56 x 56 x 56 cm)

	VOLUME	SHELVES*	SHELF AREA
320, 320-1:	6.2 cu. ft.	5	13.4 sq. ft.
322, 322-1:	12.4 cu. ft.	10	26.8 sq. ft.
325, 325-1:	12.4 cu. ft.	10	26.8 sq. ft.

*A MAXIMUM OF 10 SHELVES IN SINGLE UNIT AND 20 SHELVES IN DUAL UNITS CAN BE USED.

UNIT'S ENVIRONMENTAL OPERATING CONDITIONS:

POLLUTION DEGREE:	2
INSTALLATION CATEGORY:	II
ALTITUDE:	2000 Meters MSL (Mean Sea Level)
HUMIDITY:	80% maximum, non-condensing
ELECTRICAL SUPPLY:	120VAC or 240VAC
VOLTAGE TOLERANCE:	±10% of normal rated line
TEMPERATURE:	15ºC to 40ºC
PRODUCT USAGE:	This product is intended for use indoors **only**

SECTION 4

INSTALLATION

√*SHIPPING CARTON:*

This should be inspected upon delivery. When received, carefully examine for any shipping damage before unpacking. If damage is discovered, the delivering carrier should both specify and sign for the damage on your copy of the delivery receipt.

Open the carton carefully making certain that all parts are accounted for before packaging materials are discarded—after unpacking, if damage is found, promptly report it to the carrier and request a damage inspection promptly.

IMPORTANT: Failure to request an inspection of damage within a few days after receipt of shipment absolves the carrier from any liability for damage: you must call for a damage inspection promptly.

DANGER: DO NOT USE IN THE PRESENCE OF FLAMMABLE OR COMBUSTIBLE MATERIALS OR EXPLOSIVE GASES. DO NOT USE IN THE PRESENCE OF PRESSURIZED OR SEALED CONTAINERS—FIRE OR EXPLOSION MAY RESULT, CAUSING DEATH OR SEVERE INJURY.

WARNING: DO NOT HEAT ANY SUBSTANCE ABOVE A TEMPERATURE THAT WILL CAUSE IT TO EMIT TOXIC FUMES—DEATH OR SEVERE INJURY MAY RESULT.

CAUTION: THIS UNIT IS DESIGNED FOR USE WITH GASEOUS AIR, CO_2 OR NITROGEN ONLY. DO NOT USE WITH ANY OTHER GASES. FAILURE TO OBSERVE THESE PRECAUTIONS CAN RESULT IN EXPLOSION AND/OR FIRE AND SERIOUS INJURY AND/OR DEATH AND PROPERTY DAMAGE.

LOCATION:

Place the unit where it will be used, away from external vibration sources, drafts and wide variations in ambient temperature. Choose a location near a power supply that matches the unit nameplate requirements.

ELECTRICAL CONNECTION:

120 VAC models require a 120 VAC, 50/60 Hz power source. They are supplied with a 3-wire line cord. It should be plugged into an outlet designed for 3-prong plugs. If an extension cord is used, it also should be the 3-wire grounded type. For an outlet designed to accept 2-prong plugs (ungrounded), it is required that a qualified electrician replaces the outlet with a new, grounded type.

240 VAC models require a 240 VAC, 50/60 Hz power source. Because of the variety of plug configurations in use worldwide for 240 VAC power, the unit is furnished with the plug removed. The user must install a plug to conform to local code and configuration requirements.

If a plug must be installed, use only the 3-prong grounded type, rated for the unit load requirements and matching the power outlet. Make sure the green ground wire is secured to the plug ground terminal.

NOTE: LEAVE UNIT DISCONNECTED WHEN NOT IN USE.

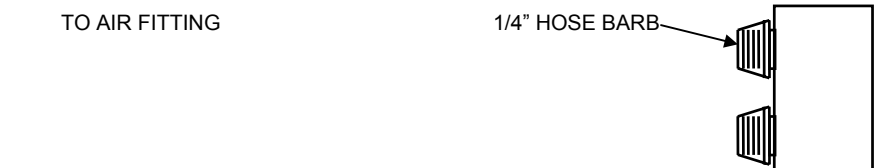
INSTALLATION: (Con't)

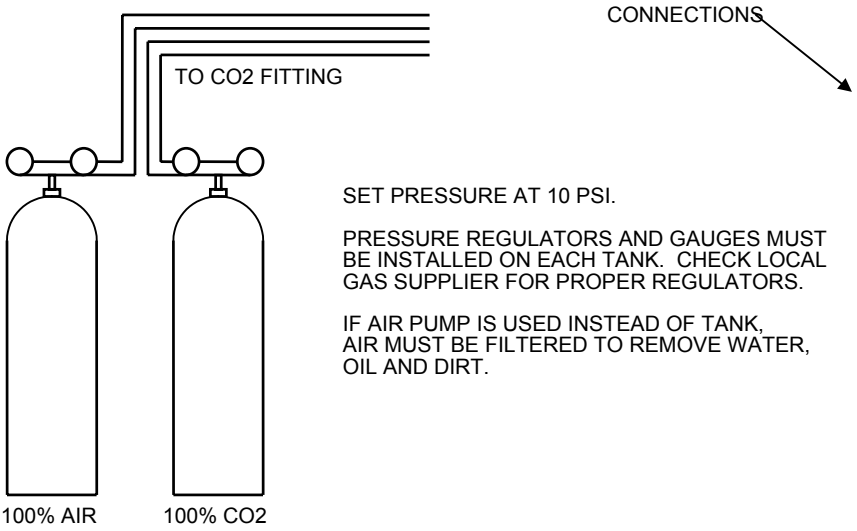
HUMIDIFICATION:

To raise the humidity level in the chamber above ambient, add water to the humidity pan in the chamber.

AIR/CO_2 HOOK-UPS:

Turn the power switch to **OFF** and insert the plug into the outlet.




CONNECTIONS
TO CO2 FITTING
SET PRESSURE AT 10 PSI.
PRESSURE REGULATORS AND GAUGES MUST BE INSTALLED ON EACH TANK. CHECK LOCAL GAS SUPPLIER FOR PROPER REGULATORS.
IF AIR PUMP IS USED INSTEAD OF TANK, AIR MUST BE FILTERED TO REMOVE WATER, OIL AND DIRT.
100% AIR
100% CO2

Turn all flow meters on the incubator fully clockwise (closed). Connect air and CO_2 supply lines to their respective fittings on the back of the unit. Use 1/4" ID tubing, flexible metal hose, etc., (meeting local codes), with filters to insure that the air and CO_2 are free of contaminants, for gas lines.

Set the supply regulators at 10 psi. Check all of the connections for leaks.

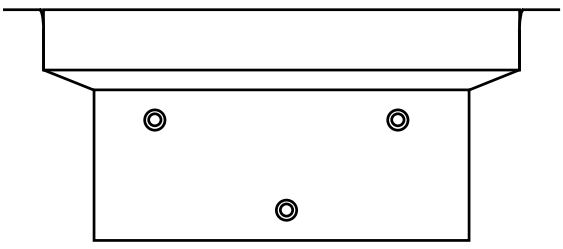
NOTE: FOR DUAL CHAMBER MODELS, EACH CHAMBER HAS A SEPARATE SET OF AIR AND GAS FITTINGS.

WARNING: HIGH CONCENTRATIONS OF CARBON DIOXIDE PRODUCE METABOLIC ABNORMALITIES, DISTURBANCES OF THE CENTRAL NERVOUS SYSTEM AND CARDIAC INSTABILITY. UNCONSCIOUSNESS MAY OCCUR AT CONCENTRATIONS ABOVE 10%.

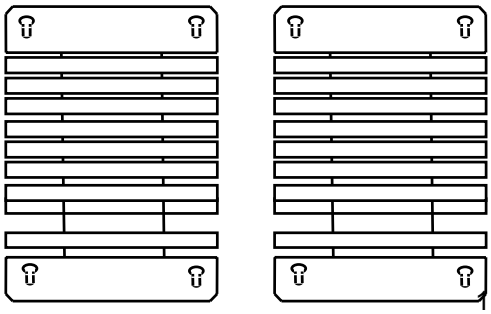
INSTALLATION: (Con't)

SHELVING/PLENUM INSTALLATION-SELF-SUPPORTING SYSTEM COMPONENTS:

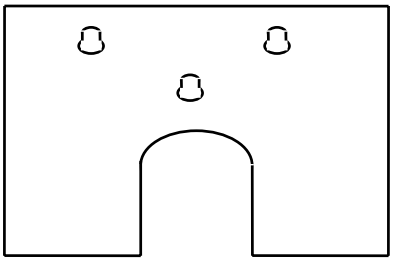
TOP PLENUM



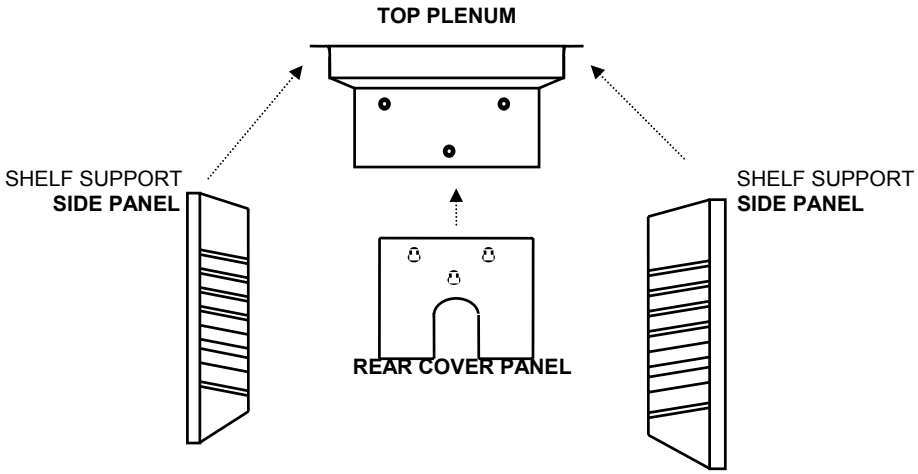
SHELF SUPPORT SIDE PANELS



REAR COVER PANEL



SHELVING/PLENUM INSTALLATION-SELF-SUPPORTING SYSTEM ASSEMBLED

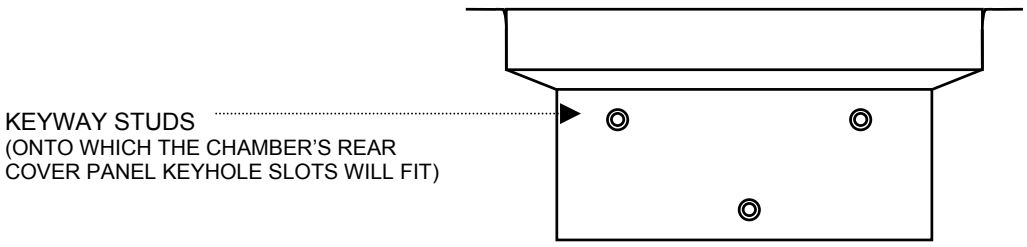


INSTALLATION: (Con't)

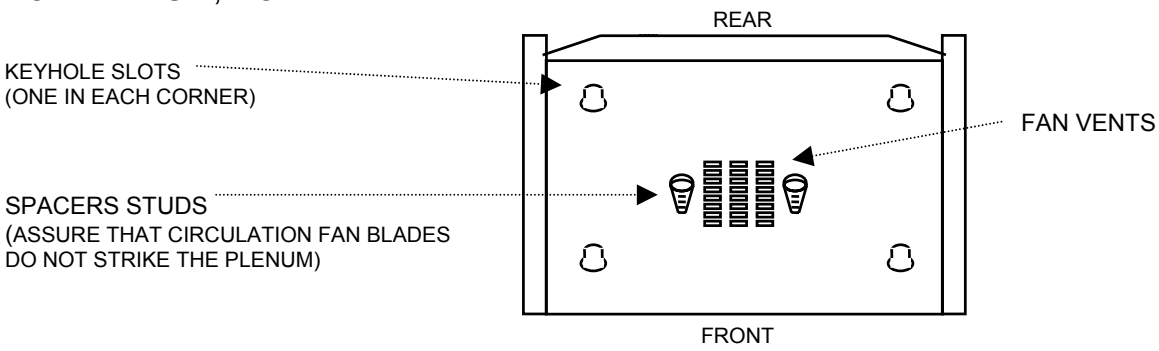
SHELVING AND PLENUM INSTALLATION-4 STEPS:

NOTE: NO TOOLS OR FASTENERS ARE REQUIRED. THE COMPONENTS FIT TOGETHER INTO A SELF-SUPPORTING ASSEMBLY.

TOP PLENUM, HEAD-ON VIEW:



TOP PLENUM, DOWN VIEW:

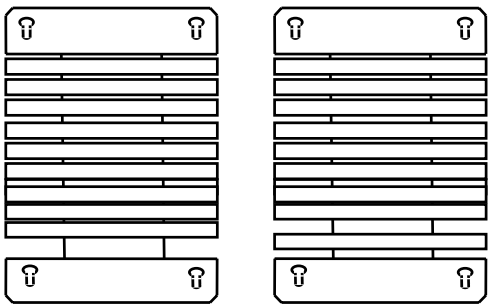


1. Open the outer and inner front chamber doors. Hold the top plenum with the spacer studs up and the keyway studs toward the rear. Tilt the panel at an angle and carefully move it into the chamber while lifting and centering it at the top of the chamber. Insert the larger keyhole slots located at the plenum's corners over the four studs suspended from the chamber ceiling. Slide the top plenum toward the rear of the chamber locking the plenum into place on the studs.

INSTALLATION: (Con't)

SHELVING AND PLENUM INSTALLATION: (Con't)

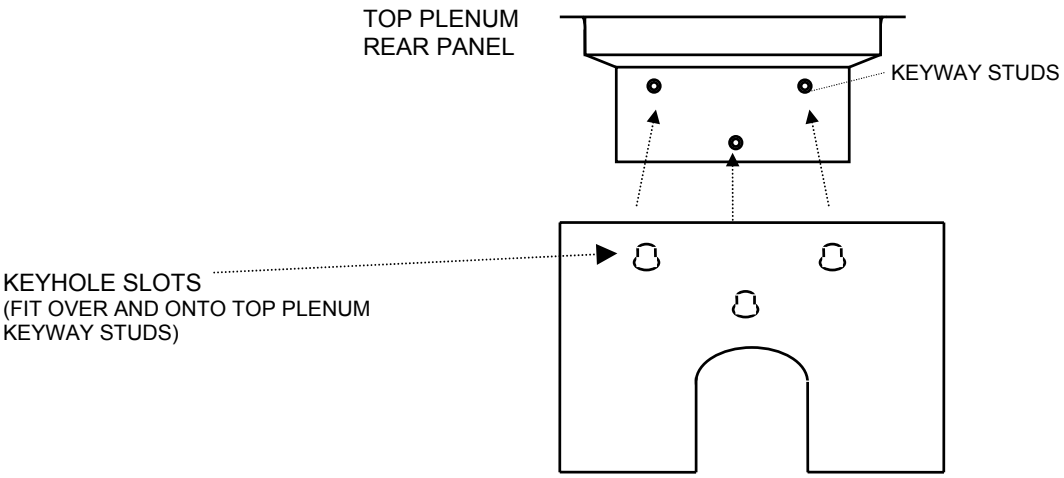
SHELF SUPPORT SIDE PANELS (2), HEAD ON VIEW:



2. With the top plenum properly secured to the chamber ceiling, a space on each side of the plenum is created into which the top of

each of the shelf support side panels will fit. Tilt a support side panel at an angle and move it into the chamber. Carefully slide the panel over the studs protruding from one side of the chamber wall and lock it into place. Repeat this procedure on the other side to install the second side panel.

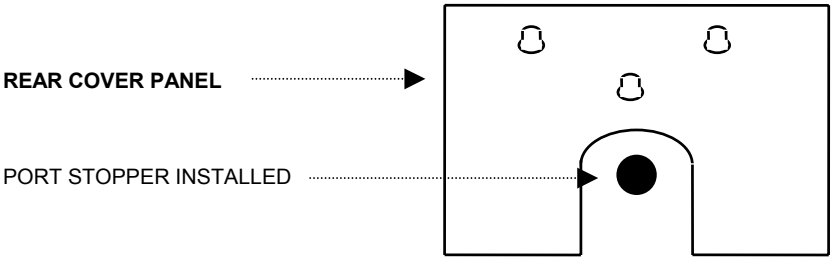
REAR COVER PANEL, HEAD-ON VIEW:



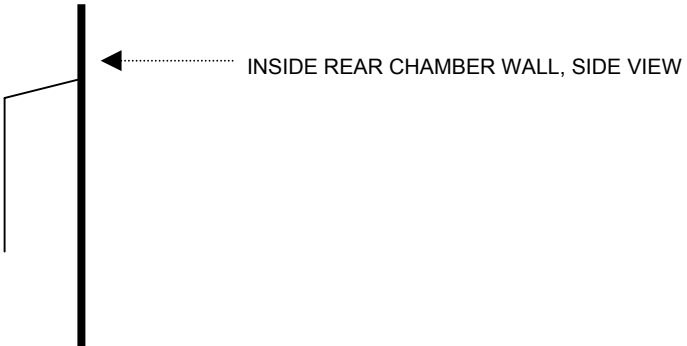
3. Move the rear cover panel into the chamber and place its keyhole slots over and onto the top plenum keyway studs, moving the back wall slots down and locking them onto the keyway studs.

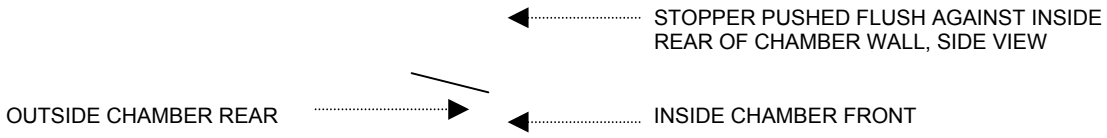
INSTALLATION: (Con't)

PORT STOPPER:

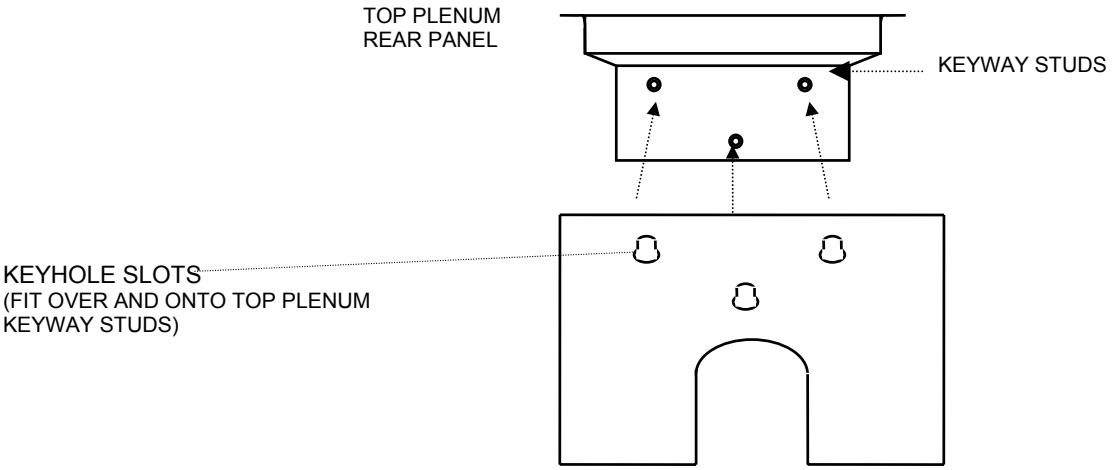


Insert the inner, narrower edge of the port stopper into the port opening located on the rear chamber wall. Make sure the outer, wider edge is flush with the rear chamber wall.





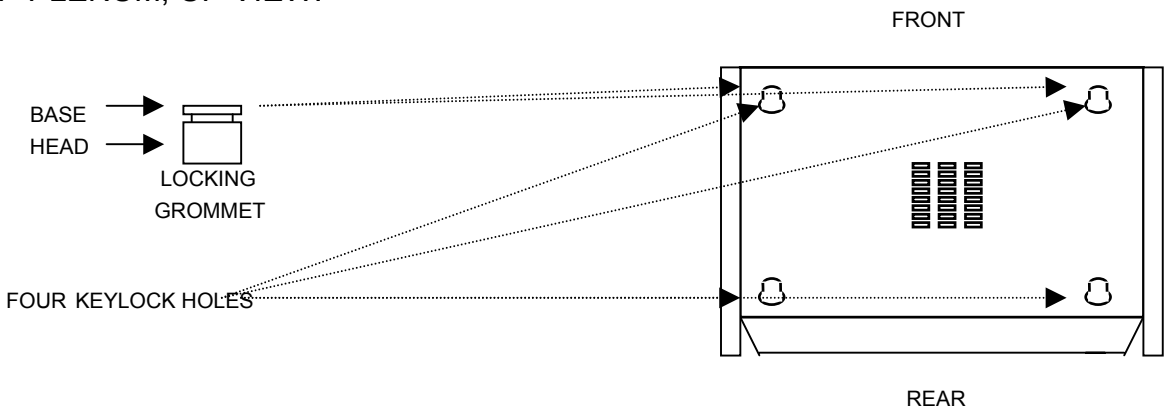
FALSE BACK WALL, HEAD-ON VIEW:



3. Move the rear cover panel into the chamber placing its keyhole slots over and onto the top plenum keyway studs, moving the back wall slots down,locking them onto the keyway studs.

INSTALLATION: (Con't)

TOP PLENUM, UP VIEW:



4. Press a locking grommet (two supplied) into the two front keyhole slots adjacent to the stud from which the top plenum is secured. Make sure that the entire head of the locking grommet is inserted into the keyhole slot. This prevents the top plenum from being accidentally pulled out.

INSTALLATION: (Con't)

INSTALLATION OF GAS FILTER INTERFACE ASSEMBLY KIT #018-514-00:

Note: One kit should be connected to the air outlet and another kit to the CO_2 outlet on the back of the incubator.

KIT #018-514-00 INCLUDES:

- 4, Hose Clamps (#250-331-00)
- 1, In-Line Filter (#525-034-00)
- 1, 10 ft. (4.57m) length of 1/4" (6.35mm) ID PVC tubing (#720-418-00)

INSTALLATION PROCEDURE:

See next page for illustration.

- Turn the unit's power switch to the **OFF** position.
- Connect one length of tubing to CO_2 tank gas outlet and another length of tubing to the air tank outlet.
- Connect remaining end of 1/4" (6.35 mm) ID tubing to hose barb on one side of in-line filter and secure with hose clamp, connect another length of same size tubing to hose barb on filter's other side and secure with hose clamp. This is to be done for both air and CO_2.

- Connect remaining end of tubing with in-line filter in place to the appropriate gas and air inlet fittings on the back of the unit.
- Set the supply regulators at 10 psi.
- Check all of the connections for leaks.
- Turn the unit power switch to the **ON** position.

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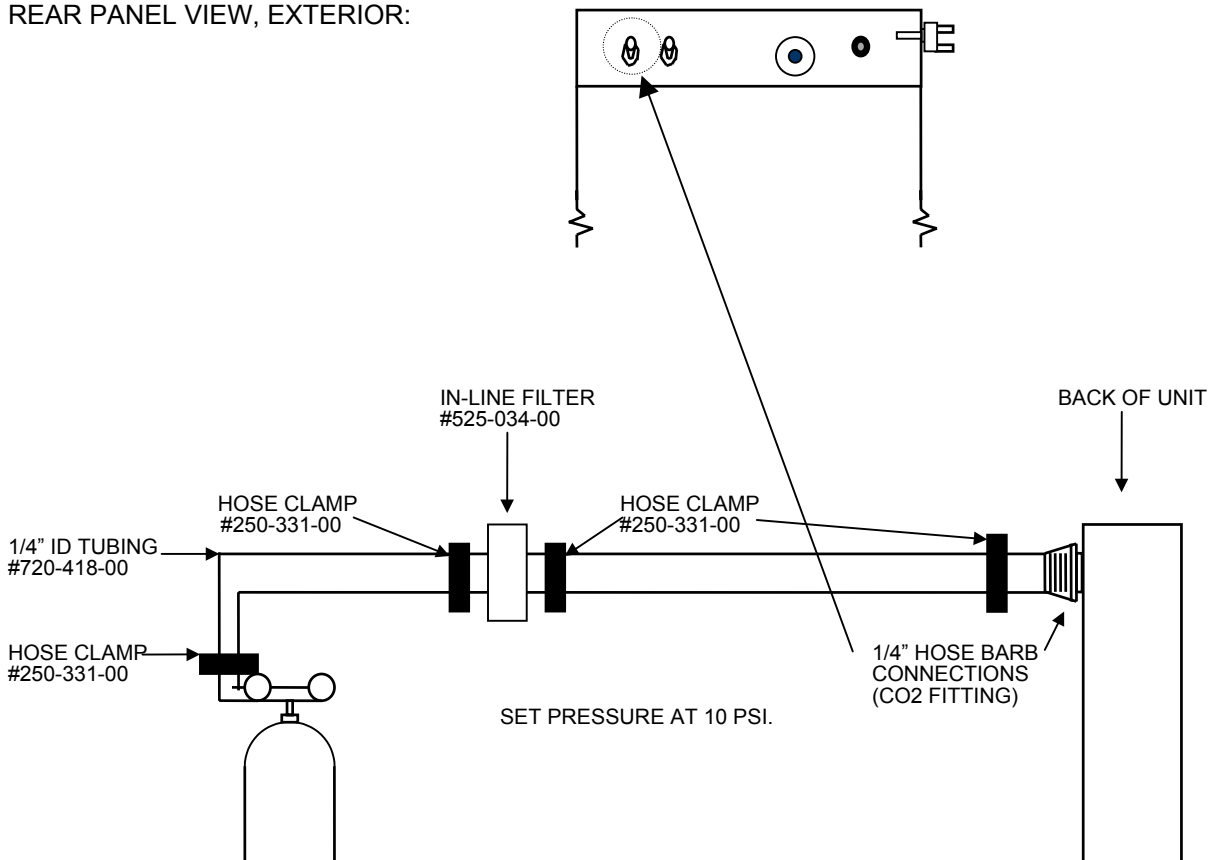
INSTALLATION: (Con't)

INSTALLATION OF GAS FILTER INTERFACE ASSEMBLY KIT #018-514-00: (Con't)

BACK OF UNIT
REAR PANEL VIEW, EXTERIOR:



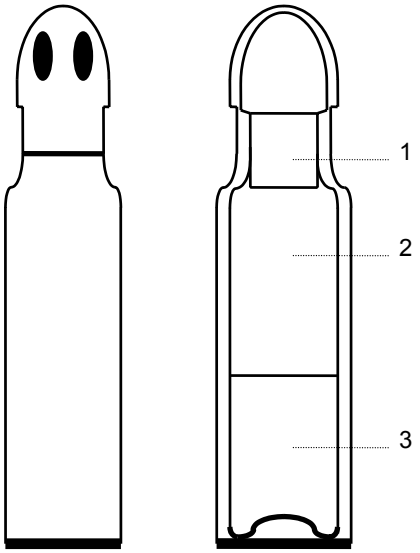
PRESSURE REGULATORS AND GAUGES MUST BE INSTALLED ON EACH TANK. CHECK LOCAL GAS SUPPLIER FOR PROPER REGULATORS.

100% CO2

INSTALLATION: (Con't)

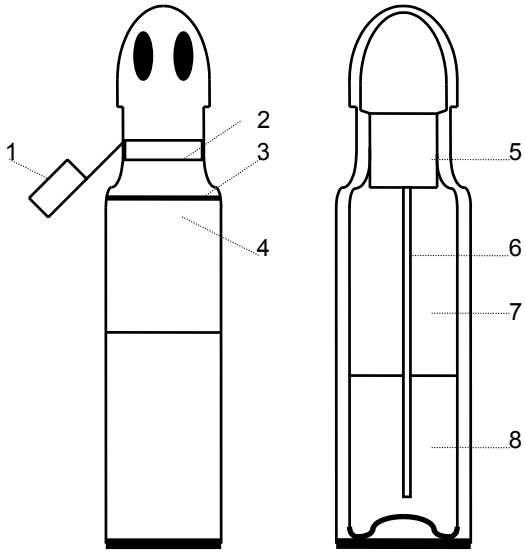
CO_2 CONNECTION: STANDARD AND SIPHON TYPE CO_2 GAS CYLINDERS

STANDARD TYPE (CORRECT)



1. Compressed Gas Association #320 connector.
2. Gas head-space.
3. Liquid CO_2 filled to 68% equal weight of water that

SIPHON TYPE (INCORRECT)



1. Warning tag indicating that cylinder is siphoning type.
2.* Aluminum ring.
3.* Gold band.
4.* Stamp or marking on cylinder:

cylinder would hold at 60ºF.

"Siphon" or "Eductor Tube".

5.* Valve should be of special type for service.
6.* Withdrawal tube draws up the liquid CO_2.
7.* Gas head space.
8.* Liquid CO_2 filled to 68% equal weight of water that cylinder will hold at 60ºF.

*__NOTE__: SOME GAS SUPPLIERS WILL HAVE NO MARKINGS TO INDICATE AN "EDUCTOR TUBE" OR "SIPHON" TYPE CYLINDER—BE SURE TO ORDER **DRY, LAB-GRADE CO2.**

Be sure to obtain a dual-stage regulator for the CO_2 tank that is to be installed according to local codes. Connect ¼" ID flexible tubing to the regulator. Connect the other end of the tubing to the unit's CO_2 inlet located on the back top panel. Insert tubing over hose barb and fasten with an appropriate clamp to assure a proper connection. Adjust the regulator for 10 psi when CO_2 is to be injected into chamber. For optimum results, do not exceed or reduce this pressure.

INSTALLATION: (Con't)

BE ADVISED:

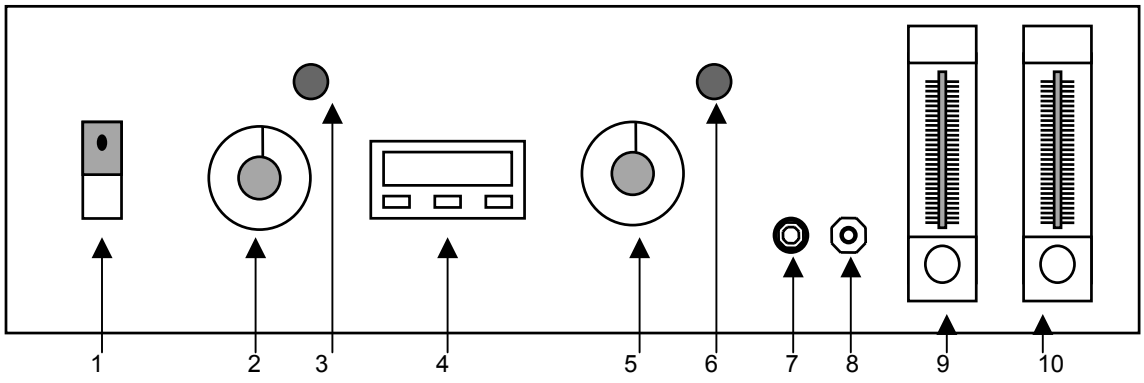
IT IS OUR RECOMMENDATION THAT THIS UNIT RUN 24 HOURS EMPTY BEFORE INTRODUCING MEDIA TO BE INCUBATED. THIS WILL FACILITATE EASE OF SERVICING IF REQUIRED AS WELL AS NULLIFY THE NEED TO DECONTAMINATE THE CHAMBER IN THE EVENT A PROBLEM OCCURS.

THIS UNIT CANNOT BE ACCEPTED FOR SERVICING OR CREDIT BY LAB-LINE UNLESS ACCOMPANIED BY A COMPLETED CERTIFICATION OF DECONTAMINATION FORM, INCLUDED AT THE BEGINNING OF THIS MANUAL.

SECTION 5

OPERATION

CONTROL PANEL



1. POWER SWITCH
   #440-359-00
2. HI-LIMIT THERMOSTAT
   #920-301-00 (THERMOSTAT), #560-223-00 (KNOB)*
3. HI-LIMIT THERMOSTAT STATUS LAMP
   #360-233-01 (LAMP BASE)*
4 TEMPERATURE CONTROLLER
   #485-360-00*
5. KWIK-INJECT TIMER
   #485-180-00*
6. KWIK-INJECT STATUS LAMP
   #360-233-01 (LAMP BASE)*
. 7. INJECTION BUTTON
8. SAMPLE ACCESS PORT
9. AIR FLOW METER
   #660-101-00*
10. CO2 FLOW METER
    #660-100-00*

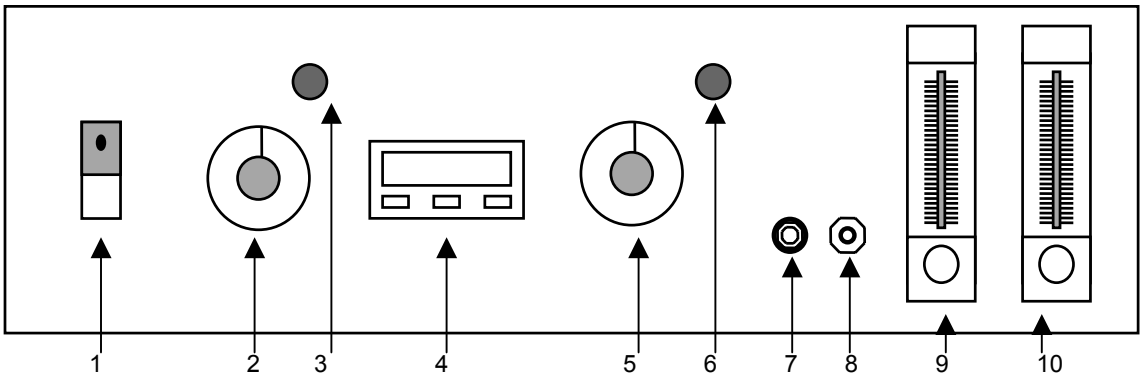
START UP:

- Push the power switch (1) to **ON**—it will light when power is on. Dual chamber models have 2 separate power switches that light; dual chambers can be used independently or together.
- Rotate the hi-limit thermostat (2) knob fully clockwise; then set the temperature controller (4) to the desired temperature set point.
- Repeat second and third steps as needed until set point is maintained.

*AS LISTED ON UPCOMING REPLACEMENT PARTS LIST

OPERATION: (Con't)

CONTROL PANEL



1. POWER SWITCH
   #440-359-00
2. HI-LIMIT THERMOSTAT
   #920-301-00 (THERMOSTAT), #560-223-00 (KNOB)*
3. HI-LIMIT THERMOSTAT STATUS LAMP
   #360-233-01 (LAMP BASE)*
4 TEMPERATURE CONTROLLER
   #485-360-00*
5. KWIK-INJECT TIMER
   #485-180-00*
6. KWIK-INJECT STATUS LAMP
   #360-233-01 (LAMP BASE)*
. 7. INJECTION BUTTON
8. SAMPLE ACCESS PORT
9. AIR FLOW METER
   #660-101-00*
10. CO2 FLOW METER
    #660-100-00*

SETTING THE HI-LIMIT THERMOSTAT:

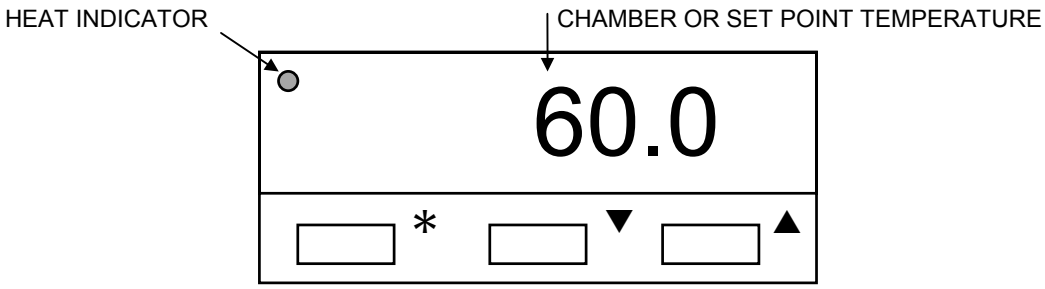
- When the temperature set point is achieved, turn the hi-limit thermostat (2) counterclockwise until the hi-limit thermostat status lamp (3) lights.
- Now rotate the **HI-LIMIT** thermostat clockwise 30 degrees of rotation past the point where the lamp goes out. **THIS DISTANCE SHOULD BE**

SIMILAR TO THE DISTANCE FROM THE TWELVE O'CLOCK TO THE ONE O'CLOCK POSITIONS. This establishes a buffer of a few degrees between the operating set point and the HI-LIMIT temperature set point and allows control to function normally.

NOTE: THE H-LIMIT SETTING MUST BE CHANGED EACH TIME THE CONTROL SETTING (SETPOINT) IS CHANGED.

OPERATION: (Con't)

TEMPERATURE CONTROLLER:



1. CONTROLLER SELF-TEST: When the incubator is powered up the controller will display **8888** along with the three decimal points and the heat **ON** indicator lamp. The display will then blank out for 2 seconds before showing the chamber temperature.

2. HEAT **ON** INDICATOR: The heat **ON** indicator lamp is lit when the chamber heater is receiving power. The lamp will normally flash when the chamber temperature is at set point.

3. SET POINT ADJUSTMENTS: The temperature controller normally displays the chamber temperature. To view or change the temperature set point proceed as follows:

PRESS	CONTROLLER
*	View set point
* ▼	Decrease set point

✻▲ Increase set point

A. Press and hold the star key and use either the up or down arrow-key to adjust the set point to the desired temperature. Release the star key.
B. Allow at least 30 minutes for the chamber temperature to stabilize.

OPERATION: (Con't)

TEMPERATURE CONTROLLER: (Con't)

AUTO-TUNE:

The auto-tune program automatically adjusts the controller parameters to achieve optimal temperature control.

It is not necessary to run the auto-tune program when setting up the incubator. However, if the temperature appears to be unstable, the auto-tune program can be run using the procedure shown below:

FOR BEST RESULTS:

- Set the usual set point temperature and use normal load conditions.
- Allow the incubator to stabilize at set point for at least 30 minutes.

AUTO-TUNING PROCEDURE:

A. Enter the program mode by pressing and holding BOTH the up and down arrow-keys for 3 seconds.

B. Release BOTH arrow-keys when **tunE** is displayed.

C. The controller display should now be alternating between **tunE** and **oFF.**

D. Press and hold the "**STAR**" (✻) key. Press and release the up arrow-key until **At.SP** is displayed. Release the "**STAR**" (✻) key.

E. After one minute has elapsed, the controller display will begin to alternate between showing the **chamber temperature**, **tunE** and **At.SP**.

F. Allow the program to run until the display again shows only the chamber temperature.

OPERATION: (Con't)

TEMPERATURE CONTROLLER: (Con't)

TEMPERATURE CALIBRATION:

A. Place a calibrated thermometer near the approximate geometric center of the chamber.

B. Press and hold the **"STAR"** (✻) key and using the up or down arrow-key, adjust the set point to the desired temperature.

C. Allow the unit to run for at least 30 minutes.

D. The controller display should now be indicating the set point temperature. Make note of the thermometer reading.

E. Press and hold both arrow-keys until the controller display indicates **tunE**. Release the arrow-keys. Press and release the down arrow-key, the display should now indicate **LEUL**. Press and hold the **"STAR"** (✻) key and using the up arrow-key adjust the display to read **3**. Release the **"STAR"** (✻) key. Press and release the up arrow-key until the display indicates **Zero**. The display should now alternate between **Zero** and a numerical value.

F. Using the examples shown below and the thermocouple value obtained in step above, enter the correct **Zero** value into the controller by pressing the **"STAR"** (✻) key and using the up or down arrow-keys. If there is already a **Zero** value present then add the new value to the one already present.

Thermometer	=	55 °C	Thermometer	=	65 °C
Controller Reading	=	60 °C	Controller Reading	=	60 °C
Subtract	=	-5 °C	Subtract	=	+5 °C
Enter **Zero** value of -5 °C			Enter **Zero** value of +5 °C		

G. When the correct **Zero** value has been entered, press and hold the two arrow-keys together until the display again indicates the chamber temperature. If the procedure was done correctly, the controller display should now agree with the thermometer reading to within ±0.5°C.

H. Allow the unit to run for at least 30 minutes.

I. Re-check the thermometer reading, the controller display and the thermometer should agree to within ±0.5ºC. If not, repeat steps D, E and F above.

OPERATION: (Con't)

LOADING THE INCUBATOR:

Load the chamber, spacing the items as far apart as possible for maximum air circulation.

AIR/GAS RATIO:

Set the flow meters to obtain the required air and CO_2 flow—using the lowest possible CO_2 flow rate will help to conserve gas.

Use one of the following formulas or the nomogram on upcoming page to find the desired air-to-gas ratio:

R = % CO_2 in the chamber atmosphere
A = Air flow in liters/minute
C = CO_2 flow in liters/minute

Equation 1 (to be used if air and CO_2 flow rates are known):

$$R = \frac{C}{A + C} \times 100$$

Equation 2 (to be used if air flow rate and % CO_2 are known):

$$C = \frac{RA}{100 - R} \text{ liters/min.}$$

Equation 3 (to be used if CO_2 flow rate and % CO_2 are known):

$$A = \frac{100C - RC}{R} \text{ liters/min.}$$

Example 1: If a CO_2 percentage of 15% is desired at a flow rate of 0.4 liters/min. of CO_2, use Equation 3:

$$A = \frac{100\,(0.4) - 15\,(0.4)}{15} = \frac{40 - 6}{15}$$

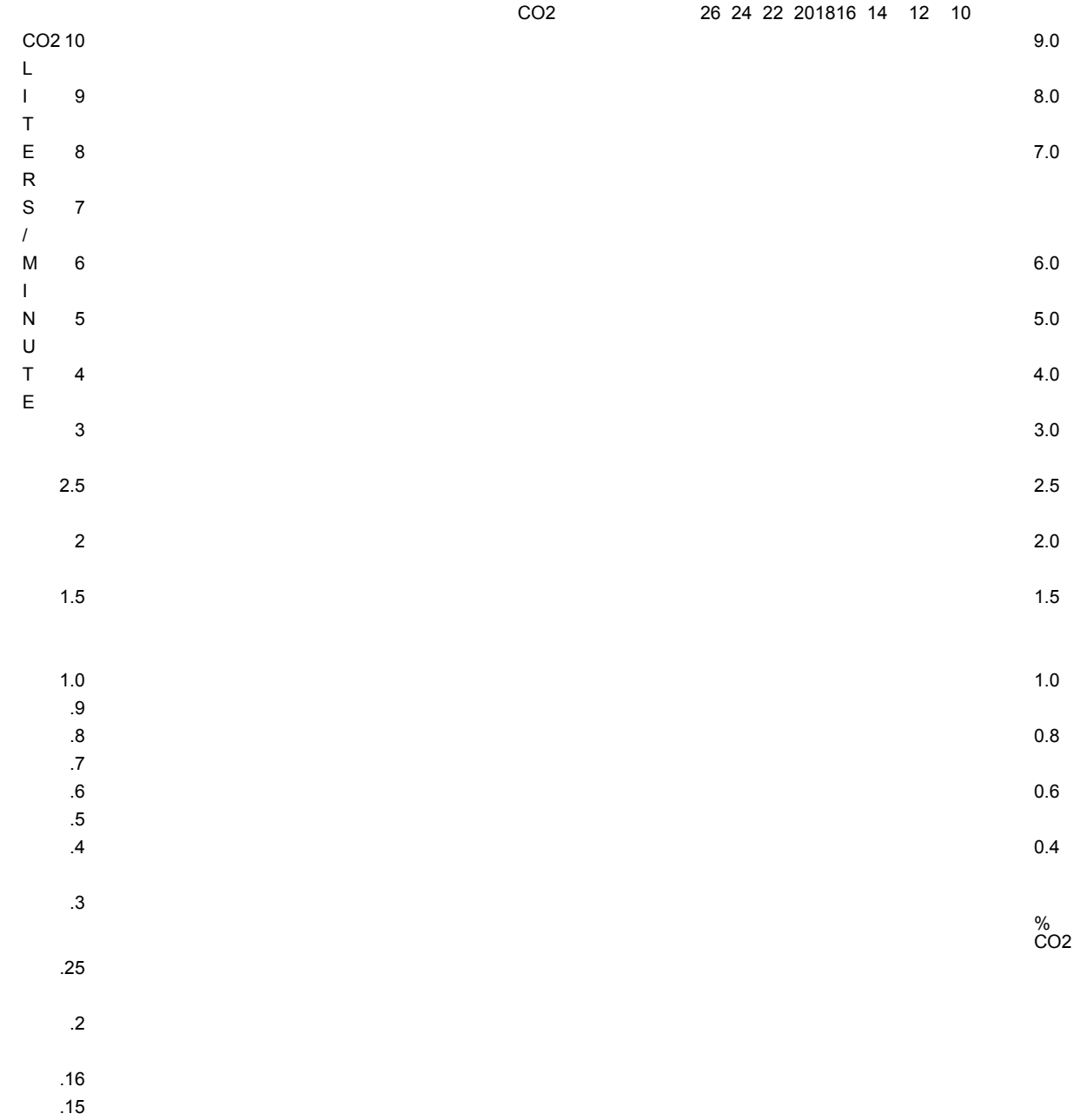
$$= 2.26 \text{ liters/min. of air}$$

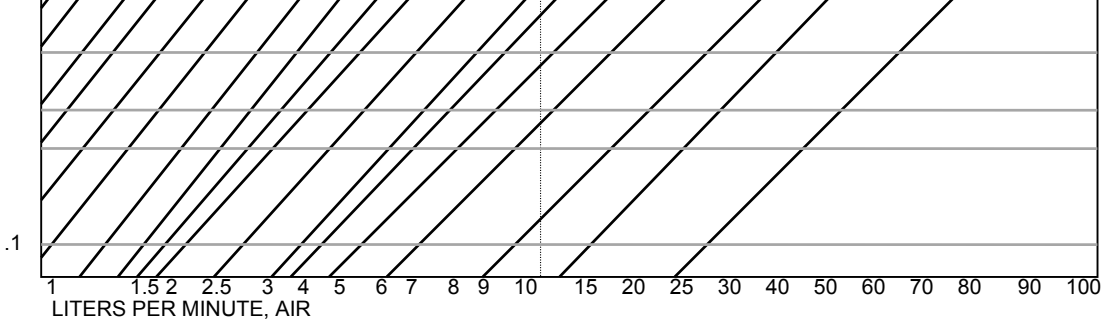
Example 2: If flow rates are set 0.1 liters/min. of CO_2 and 3 liters/min. of air, use Equation 1 to find percentage of CO_2:

$$B = \frac{0.1}{3.0 + 0.1} \times 100 = 3.2\%\ CO_2 \text{ in chamber atmosphere}$$

OPERATION: (Con't)

AIR/CO_2 RATIO NOMOGRAM:





1. DRAW A VERTICAL LINE FROM THE POINT THAT REPRESENTS THE AIR FLOW ON THE HORIZONTAL AXIS UNTIL IT INTERSECTS A DIAGONAL LINE INDICATING THE REQUIRED VOLUME (%) OF CO2 FLOW; 2. RUN A HORIZONTAL LINE TO THE VERTICAL AXIS TO FIND REQUIRED FLOW OF CO2 IN LITERS/MINUTE, 3. TO OBTAIN THE AIRFLOW (IF CO2 FLOW IN LITERS/MINUTE AND % CO2 ARE KNOWN), REVERSE THIS PROCEDURE.

OPERATION: (Con't)

OPERATING SUGGESTIONS:

- In order to obtain and maintain the desired CO_2 gas pressure, periodically check the tightness and integrity of the gasket that secures the glass door to the chamber.
- To be sure of maintaining desired gas pressure, periodically check outflow pressure from gas supply source.
- If maintaining humidity conditions within the chamber, check water level in pan and replenish as necessary.
- After power is disconnected to the unit, do not permit humidity water to remain in the unit. Remove any pans and/or dry the interior thoroughly.
- Insofar as possible, keep the incubator door closed in order to reduce the possibility of fungus growth starting from airborne organisms entering the chamber.

DOOR DEFOGGER:

The door heat control on the back panel should be off except when fogging of the inner door occurs. If this happens close the outer door and turn on the heat control. Rotate counterclockwise to increase heat and clockwise to decrease heat. Wait a few minutes before opening door to see if fog dissipates. If not, turn control in increments of 1 to higher setting.

CO_2 SAMPLING/MEASUREMENT:

Insert sample probe into the sample access port on the control panel making sure that a tight seal is attained. Obtain a sample of CO_2 sufficiently large to meet the requirements of the analytical apparatus or procedure being used. Perform CO_2 analysis.

OPERATION: (Con't)

HINTS ON USING THE FYRITE:*

The following information is intended to supplement that found in the Fyrite manual and is based on experience working with users of our Incubators.

One of the most important aspects of using the Fyrite procedure and one that is frequently overlooked is the condition of the fluid. The Fyrite accepts a sample of the Incubator's environment into its own chamber where it is absorbed by the Fyrite fluid to determine the CO_2 percentage or tension. Of special importance is keeping outside air from the sample drawn from the Incubator. Any outside air contaminating the sample is detrimental to an accurate reading and, more importantly, to the growth of your cells.

Inspection of the fluid should be performed only with the user wearing protective gloves, as the Fyrite fluid is slightly corrosive. The inspection should review the following:

- THE DATE OF THE LAST FLUID CHANGE: Old fluid will not absorb as much CO_2 and will produce a false reading. This may lead the user to recalibrate the Incubator to higher CO_2 tensions that can prove lethal to cell cultures. Fyrite fluid should be changed after approximately 350 uses. This approximates a change of fluid once a year if the Fyrite procedure is carried out on a daily basis. Keep track of the number of uses and if the Fyrite is used with more than one Incubator. Experience shows that the color of the fluid is not as important as the age of fluid.

- CHECK THE CONTAINMENT VESSEL AND HOSES AT LEAST ONCE A MONTH: Make sure that there are no cracks in the vessel or leakage of fluid to the outside of the container. This can indicate a leaky seal or internal crack. Hoses should be stretched slightly and inspected for cracks or holes. This is critical as cracks and/or holes in the hoses can draw in outside ambient air and produce a false reading.

- CHECK THE FLUID DAILY AND ADJUST THE SLIDE GAUGE TO READ ZERO: If you have adjusted the slide gauge all the way down and the fluid level is still too low, place a couple of drops of distilled water into the plunger on the top of the Fyrite. Depress the plunger and the water will transfer into the Fyrite causing the fluid level to rise. Repeat this procedure until the fluid level reads correctly.

CAUTION: A LITTLE WATER GOES A LONG WAY—USE ONLY A COUPLE OF DROPS OF DISTILLED WATER AT A TIME.

CAUTION: DO NOT USE FYRITE FLUID TO ADJUST THE LEVEL OF FLUID USE DISTILLED WATER ONLY. THE ONLY TIME TO USE FRESH FYRITE FLUID IS WHEN YOU CHANGE IT DUE TO THE AGE OF THE FLUID.

Inspect the Fyrite filter in the clear plastic casing between the hoses for any contamination or growth. Change it if necessary.

*Trademark Of Bacharach Instruments

OPERATION: (Con't)

HINTS ON USING THE FYRITE:* (Con't)

CAUTION: MAKE SURE THE FILTER IS MOIST BEFORE TAKING A READING—A MOIST FILTER IS A MUST FOR AN ACCURATE READING.

To moisten the filter, remove the end of the short hose without the squeeze bulb that connects to the Incubator. Add several drops of distilled water to the filter, replace the hose and squeeze the bulb. Release the bulb and the water will be drawn into the filter. Squeeze the bulb and quickly release it to remove any excess water. This water, if any, comes out of the end of hose that is closest to the squeeze bulb. This is the cupped end that is depressed onto the Fyrite.

TAKING A FYRITE READING:

It is recommended that Fyrite CO_2 and independent temperature tests be performed at intervals to be determined individually or as dictated by established protocol. Some laboratories conducting critical work may want to record CO_2 and temperature readings on a daily basis.

CAUTION: THE INCUBATOR MUST BE STABLE.

First, clear the Fyrite of any residue CO_2. Simply depress the plunger on the head or the top of the Fyrite taking care not to cover the hole—this introduces fresh ambient air into the Fyrite chamber. Release the plunger and turn the Fyrite upside down, holding it at a 45-degree angle until most of the bubbles surface and the fluid has filled the head. Even the smallest bubbles may contain CO_2, so that it is important to let most of the smaller bubbles surface.

Now turn it right side up and hold it at 45 degrees. Allow the fluid to fill the Fyrite and depress the plunger again—this clears the Fyrite of any CO_2 that might cause a false reading.

Next, attach the filter side of the hose to the Incubator's CO_2 sample port. Remove the brass tube, if present, from the Fyrite hose, as it is not needed and attach the hose to the CO_2 sample port. The brass tube was once used with older Incubators that utilized a hole in the Incubator wall or door to measure CO_2 but this method proved to cause contamination problems.

LOOK AT YOUR FYRITE GAUGE AND ADJUST THE ZERO IF NECESSARY.

Take the squeeze bulb end of the hose and with the hole of the cupped end facing down, place it onto the plunger of the Fyrite and hold it firmly in position.

IMPORTANT: ONCE YOU HAVE DEPRESSED THE PLUNGER OF THE FYRITE, IT IS CRITICAL THAT IT **NOT** BE RELEASED DURING THE FOLLOWING PROCEDURE.

OPERATION: (Con't)

TAKING A FYRITE READING: (Con't)

Depress the plunger and hold it down. It is very important not to allow the plunger to spring up—if this occurs, an already existing reading will be repeated. It will not matter how many times the squeeze bulb is pumped, as long the plunger is held down only one sample will be introduced to the Fyrite. But, by releasing the plunger and immediately pushing it back down, an additional sample will be added to the Fyrite chamber causing the reading to double or triple. In the event that it is difficult to hold the plunger down while pumping the squeeze bulb, find a more suitable or comfortable position.

Without releasing the plunger, pump the squeeze bulb at least 20 to 30 times—this assures complete and thorough transfer of the sample to the Fyrite chamber. Once the bulb has been pumped the required number of times, **HOLD THE SQUEEZE BULB IN THE SQUEEZED-POSITION** and release the pressure on the cup that will also release the plunger—this traps the sample from the Incubator in the Fyrite chamber and allows the fluid to absorb the CO_2.

With the plunger now released, turn the Fyrite upside down again and hold at a 45-degree angle to allow the smaller bubbles to surface while the fluid fills the chamber head. Reverse and turn Fyrite right side up and hold at a 45-degree angle to allow the same thing to happen. Repeat this procedure—hold upside down at 45-degree angle and right side up at 45-degree angle. Finish by shaking the Fyrite slightly while holding at 45-degree angle to allow residue droplets of fluid to drain into the measuring tube.

Read the gauge: It should match or be close to your CO_2 set point. It is possible to be off as much as ±3%. With a reading of more than 8%, it is possible that two samples have been introduced, or the Incubator is out of calibration. If a wide variation between the reading and CO_2 set point exists, it is recommended that the sampling and measurement procedure be repeated.

Once the possibility of any error in Fyrite reading has been eliminated, calibrate the Incubator to conform to the reading obtained.

SECTION 6

MAINTENANCE

BE ADVISED:

NOTE: MAKE NO ATTEMPT TO SERVICE OR REPAIR A LAB-LINE PRODUCT UNDER WARRANTY BEFORE CONSULTING YOUR LAB-LINE DEALER. AFTER THE WARRANTY PERIOD, SUCH CONSULTATION IS STILL ADVISED, ESPECIALLY WHEN THE REPAIR MAY BE TECHNICALLY SOPHISTICATED OR DIFFICULT.

IF ASSISTANCE IS NEEDED BEYOND WHAT THE DISTRIBUTOR CAN PROVIDE, PLEASE CALL THE LAB-LINE CUSTOMER RELATIONS DEPARTMENT AT (563) 556-2241 OR (800) 522-5463. NO MERCHANDISE, HOWEVER, SHOULD BE RETURNED DIRECTLY TO LAB-LINE WITHOUT PRIOR APPROVAL FROM LAB-LINE.

CAUTION: DISCONNECT PLUG FROM ELECTRICAL OUTLET BEFORE ATTEMPTING ANY MAINTENANCE OR REPAIR OF THIS UNIT.

ROUTINE CLEANING:

Clean up spills immediately to prevent them from becoming baked on. Drain water from the water compartment and clean all chamber components with a solution of water and mild soap. Rinse thoroughly and dry. DO NOT use chlorine-based solutions or cleansers, harsh abrasives or scouring pads with metallic content. To remove built-up scale deposits, use a dilute acetic acid solution and a synthetic scrubber.

CARE AND CLEANING OF STAINLESS STEEL:

CAUTION: DISCONNECT UNIT FROM POWER SOURCE PRIOR TO CLEANING. WE RECOMMEND ALL SERVICE BE PERFORMED BY QUALIFIED SERVICE PERSONNEL.

WARNING: ELECTROLYSIS CAN DAMAGE STAINLESS STEEL. THIS OCCURS WHEN AN OBJECT IS ALLOWED TO REST DIRECTLY ON THE SURFACE OF STAINLESS STEEL, TRAPPING MOISTURE THAT BECOMES OXYGEN-STARVED, BUT IS SURROUNDED BY WATER-CONTAINING OXYGEN.

MAINTENANCE: (Con't)

THE ALLOY CALLED STAINLESS:

Stainless steel is an alloy of steel with chromium and nickel that increase the metal's resistance to rust and corrosion. Yet, if not properly cared for, stainless steel can rust and corrode.

Exposure to air provides the passivation, or oxide layer coating, for clean stainless by producing a thin, durable chromium-oxide film that forms rapidly on the alloy surface to give stainless its characteristic "stainless" quality. Also exposure of the surface to other oxidizing environments can produce a passivating film or coating.

However, if free oxygen is not available due to scale or contamination buildup the metal surface may become vulnerable to rusting and corrosion as well as pitting. But by maintaining neutral pH and conducting frequent cleanings with detergent and water, years of trouble-free service from stainless steel products can be obtained.

SOME STAINLESS GUIDELINES TO CONSIDER:

Distilled water is recommended. Please note, if this water is very pure it may be corrosive to stainless. When filling a bath or incubator, ALWAYS ADD 2 to 40 PPM (20 TO 40 MG/LITER) DISODIUM PHOSPHATE OR SODIUM BICARBONATE, ADJUSTING DOSAGE TO PROVIDE A pH VALUE OF 7 TO 9.

If not available, use clean, aerated soft tap water provided the total solids concentration is < 500 PPM.

WE DO NOT RECOMMEND USING 18 MEG OHM DEIONIZED WATER. If this is the only source of treated water available—mix with regular tap water at a 50/50 ratio.

THE pH FACTOR:

Check pH regularly. If pH is <6.0, add disodium phosphate to increase pH to a 7 to 9 value. Sodium carbonate or sodium bicarbonate may be used but they tend to form scale that must be rinsed out regularly. If pH is >10.0, add sodium bisulfate to decrease pH to a 7 to 9 value. Avoid adding harsh alkalines or acids since these may cause localized corrosion and result in unstable pH.

SPECIAL CONSIDERATIONS:

WARNING: IF IT IS NECESSARY TO USE THE FOLLOWING CHEMICALS, LIMIT EXPOSURE TIME TO A MAXIMUM OF 3 HOURS—ALWAYS CLEAN SURFACES IMMEDIATELY AFTER USE.

Chemicals that should be limited to a 3-hour maximum exposure time to stainless steel are:

Aluminum chloride	E.D.T.A.	Potassium permanganate
Barium chloride	Ferrous chloride	Potassium thiocyanate
Calcium chloride	Lysol	Sodium hypochlorite
Chlorinated Lime	Mercury salts	Stannous chloride
Citric acid (boiling)	Phenol	Tartaric acid
Dakin's solution		

MAINTENANCE: (Con't)

BE ADVISED: NEVER USE THE FOLLOWING ON STAINLESS STEEL:

Aqua regia
Ferric chloride
Iodine
Sodium acid
Sodium azide

Chemical spills, especially those agents listed here, should be removed as soon as possible and the stainless steel surface cleaned with mild soapy water followed by a clean water rinse.

CLEANSING AGENTS:

Anti-fungal and anti-bacterial additives are permissible to use as long as the pH of the aqueous solution is kept within the range of 7 to 9. These are available through laboratory distributors—but be sure to CONFIRM that they are not harmful to stainless steel.

CLEANING METHODS:

Do not use any metallic pads. Instead, for stubborn stains, use a plastic light-duty cleansing pad and rub GENTLY in the direction of the metal grain.

If stains continue to persist, use one of the following chemicals and methods.

CAUTION: EXTREME CARE MUST BE TAKEN WHEN HANDLING THESE MATERIALS. ALWAYS WORK IN AN AREA WITH ADEQUATE VENTILATION. USE THE PRECAUTIONS AS OUTLINED IN THE *MATERIAL SAFETY DATA SHEET* (MSDS) AND THE MANUFACTURER'S INSTRUCTIONS FOR THE PRODUCT BEING UTILIZED. ALSO, FOLLOW THE PERSONAL PROTECTION INDEX FOUND IN THE *HAZARDOUS MATERIALS INFORMATION SYSTEM* (HMIS) SECTION OF THE *MSDS*.

NOTE: THE USE AND DISPOSAL OF THESE CHEMICALS MAY BE REGULATED BY YOUR LOCAL CITY CODES; CONSULT THOSE REGULATIONS BEFORE OF DISPOSING OF THESE MATERIALS.

- Any of a variety of "scale removers" available at local supermarkets or hardware stores used for the cleaning of coffee marks, humidifiers or vaporizers.
- A 15% to 35% phosphoric acid solution available from laboratory supply distributors for scale and rust removal. Allow solution to soak the surface affected until rust and scale is loosened. Immediately follow with a clean water rise.
- Citric acid based cleaners.

MAINTENANCE: (Con't)

CLEANING METHODS: (Con't)

- Bathroom tub and tile cleaners.
- A mixture of 20% nitric acid and 1.5% hydrofluoric acid or hyrochloric acid. Swab solution on surface allowing it to remain until rust is loosened. Immediately follow with a clean water rise. This method should ONLY be used if SEVERE rust and scale stains are present.
- Oxalic acid 2% to 5% in warm water. Swab solution on surface allowing it to remain until rust is loosened. Immediately follow with a clean water rise. This method should ONLY be used if SEVERE rust and scale stains are present.

Regardless of the approach utilized, ALWAYS follow the manufacturer's directions and allow the chemicals to do the cleaning with MINIMAL scrubbing.

Always follow cleanings with a clean water rinse. Air dry.

MATERIALS EFFECTIVE IN DISINFECTING:

- Glutaraldehyde
- Alcohol

BE ADVISED: THIS INFORMATION IS INTENDED AS **GUIDELINES ONLY** AND LAB-LINE INSTRUMENTS, INC. MAKES NO CLAIM AS TO THE SUITABILITY TO ANY PARTICULAR SITUATION. CONSULT YOUR STAFF CHEMIST TO DETERMINE WHAT WOULD BE BEST FOR YOUR STAINLESS STEEL PRODUCT AND LABORATORY.

REPLACING TEMPERATURE CONTROLLER:

1. Place ON/OFF switch in **OFF** position.
2. Unplug incubator from outlet power supply.
3. To remove controller from control housing:
   - use both hands to firmly grip each side of the controller bezel
   - press on the bezel side grips until the bezel tabs release
   - slowly pull controller from housing
4. To install new, factory configured controller:
   - Carefully slide new controller into controller housing.

NOTE: *PCB contacts at rear of controller fit into contacts at rear of controller housing*

   - Press controller bezel into controller housing until bezel tabs securely lock controller into place

5. Plug incubator into outlet power supply.
6. Place ON/OFF switch in **ON** position.

SECTION 7

REPLACEMENT PARTS

DESCRIPTION	PART NUMBER
Axial Fan:	160-136-00
Cordset;	470-105-00
Feet, Leveling:	790-401-00
Flow meters:	
Air (5 liters/min.):	660-044-00
CO_2 (0.5 liters/min.):	660-043-00
Gasket, Glass Door:	530-258-00
Gasket, Outer Door:	530-246-00
Outer Heater, 50 Watt:	340-378-00
Chamber Heater, 250 Watt:	340-350-01
Knob:	560-223-00
Knob:	560-225-00
Knob, Glass Door:	560-228-00
Solenoid Valve:	950-148-00
Status Lamp Base (all models):	360-233-01
Switch, Power, 120V:	440-359-00
Switch Power, 240V:	440-292-00
Thermostat over-temperature):	920-301-00
Timer, Auto Reset:	485-180-00
Transformer, 240 V units:	460-283-00
Solid State Relay:	400-233-00
RTD Temp. Sensor:	410-632-00
Switch, SPST:	440-080-00
Configured Temperature Controller:	485-360-02
Heat Control:	920-251-00
Circuit Breaker, 5 Amp, 240VAC:	330-118-00
Red Lens:	360-234-00
Fuse, 1 Amp, 240V:	330-369-00
Gas Filter Interface Assembly:	018-514-00
Glass Door:	540-258-00
Axial Fan:	160-194-00
Circuit Breaker, 10 Amp:	330-119-00
Green Lens Cover:	360-238-00
240V Green Pilot Light Base:	360-249-01
Motor, 120V:	370-382-00
Motor, 240V:	370-383-00
Wiring Schematic, 120V:	228-399-00
Wiring Schematic, 240V:	229-012-00

NEED A PART? CALL THE LAB-LINE PARTS HOTLINE.
CALL: (800) 522-5463 or (563) 556-2241; FAX: (563) 589-0516.

LAB-LINE RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT PRIOR NOTICE.

WARRANTY

LAB-LINE INSTRUMENTS, INC. (“Lab-Line”) warrants that the product manufactured by Lab-Line shall be free of defects in materials and workmanship for a period of time defined on the following page from the first to occur of (i) the date the product is sold by Lab-Line or (ii) the date the product is purchased by the original retail customer (the “Commencement Date”). Except as expressly stated above,

LAB-LINE MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of Lab-Line must perform all warranty inspections. In the event of a defect covered by Lab-Line’s warranty, Lab-Line shall, as its sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold by Lab-Line within the continental United States or Canada, Lab-Line shall provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

Lab-Line’s warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than Lab-Line or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of Lab-Line.

IN NO EVENT SHALL LAB-LINE BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.

The name of your nearest authorized Lab-Line dealer may be obtained by calling 1-800-522-5463.

DESIGNERS AND MANUFACTURERS
A SUBSIDIARY of Barnstead|Thermolyne
1999 North 15th Ave., Melrose Park, IL 60160-1491 USA
PHONE: (563) 556-2241 or (800) 522-5463; FAX: (563) 589-0516

WARRANTY

12 MONTH PARTS WARRANTY:

- All Environmental Chambers
- Low Temperature B. O. D. Incubators
- Animal Study Chamber
- Controlled Environment Centers
- Biological Work Station
- Refrigerators, Freezers
- Chromatography Refrigerators (5 year parts warranty on compressor only)
- Large Capacity Refrigerators and Freezers (5 year parts warranty on compressor only)

24 MONTH PARTS WARRANTY:

- Frame Clamps, Frame Sets, Lab Jacks
- Saybolt Viscosimeter
- Timers, Samplers, Flasks
- Saf-T-Shield, Safety Tongs
- All Incubators & Ovens
- Dual Action Open Air Shaker
- Reciprocating Shakers (open air and water bath)
- Rockers and Rotators
- Low Cost Shakers
- Environ Blok Shaker
- Titer Plate Shaker
- Multi Wrist Shaker
- Water Baths (excluding Aquabaths), Ultrasonic Cleaners
- Slide Warmers
- Mixers, Stirrers, Hotplates
- Thermal Cyclers
- Blok Heaters
- Aquabaths, lifetime warranty on heaters

LIFETIME PARTS WARRANTY:

- All **ORBITAL** Shakers (not carrying a 24 month parts warranty) offer a lifetime parts warranty on the drive mechanism and a 5 year warranty on all other parts
- Refrigerated Orbital Shakers carry a lifetime warranty on the drive mechanism, 1 year parts warranty on the compressor, and a 5 year warranty on all other parts.

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ACCESSORY CHECKLIST

The following loose parts and accessories are packed with this unit. Before discarding any packing materials, please be sure that nothing has been overlooked.

MODEL NOs: 320, 320-1, 322, 322-1, 325, 325-1

CHECKED BY: _____

DATE _____

PACKED BY _____

CHECKED	ITEM	PART NUMBER	QUANTITY
_____	Shelves	593-108-00	5
_____	Shelf Support Side Panels	019-451-00	2
_____	Gas Filter Interface Assy*	018-514-00	2
_____	Hose Barb Quick Connect Plug (460 Series)	950-170-00	2
_____	Operation Manual	056-761-00	1
_____	Warranty Card	528-022-00	1
_____	Voltage Warning Tag (240 Volt)	528-009-00	1
_____	Mating Connector	420-006-00	1
_____	Locking Grommet	790-327-00	2
_____	Port Stopper	875-118-00	1
_____	Humidity Pan	018-637-00	1
_____	Rear Cover Panel	019-373-00	1
_____	Top Plenum	019-350-00	1

*Assy Includes 10’ PVC tubing #720-418-00